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Overweight and Obesity: A Comparative Study of Black and White Non-Hispanic Women in the United States

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Overweight and Obesity: A Comparative Study of Black and White non-Hispanic Women in the United States

A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science at Virginia Commonwealth University.

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Abstract

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The population of the United States is increasingly gaining weight each year. Americans are heavier than they have ever been. African American women are at the forefront of this pandemic. This study addresses the higher prevalence of overweight and obesity among African American women in comparison to White women. Behavioral, psychological, and social known contributors to overweight and obesity using the National Health Interview Survey, 2001 dataset were examined in this study. The research concluded that even when controlling for vigorous exercise, education, income, depression, emotional support, smoking, health coverage, and age, race is the most important predictor of body mass index. Consistent with previous studies, strong race effects still remained.

Introduction

Research Problem

Modern medicine, technology, and preventative care have enabled Americans to live longer without chronic illness. However, despite these overall advances, not all Americans benefit equally. Disparities in health exist among diverse groups of people; there is a racially divided health gap. "There are health disparities among African Americans, Hispanic Americans, Asian Americans/Pacific Islanders, and American Indians/Alaska Natives, as compared to the U.S. population as a whole" (U.S. Department of Health and Human Services (DHHS) 2003).

In the year 2000, the U.S DHHS took the initiative to eliminate racial and ethnic disparities in health by focusing on six areas in which racial and ethnic minorities experience serious disparities in health access and outcomes: infant mortality, cancer screening and management, cardiovascular disease, diabetes, HIV/AIDS, and immunizations. The disparities in access and outcomes in these six areas apply to multiple racial and ethnic groups. In this study, I address racial/ethnic disparities in women's experiences with obesity, related to cardiovascular disease, diabetes, and some cancers (endometrial, breast, and colon), specifically comparing African American and White women.

Significance of the Problem

African Americans[1] can expect to live fewer years than members of other racial/ethnic groups, and they can expect to live more years with chronic health problems (Hayward and Heron 1999). Hayward, Crimmins, Miles, and Yang (2000) studied health differences between Blacks and Whites in middle age. They found that Blacks have a significantly higher prevalence of hypertension, stroke, and diabetes than Whites. In addition, Blacks are more likely than Whites to experience multiple fatal disease conditions. This pattern also holds true for nonfatal diseases and other health problems. For example, in comparison to Whites, Blacks have significantly higher prevalence rates of asthma, foot and leg problems, kidney problems, stomach ulcers, pain, vision problems, and depression.

The specific focus of my research is on the health of African American women. Diabetes, high blood cholesterol (dyslipidemia), high blood pressure, kidney disease, heart disease, and stroke are all potentially fatal health problems that disproportionately affect African American women (Taylor and Braithwaite 2001). The one common factor linking all of these health problems is overweight and/or obesity; i.e. being overweight and/or obese increases the risk for developing these problems. Even a moderate amount of excess weight leads to a reduction in life expectancy, and as weight increases, a steady decline in life span occurs (Manson and Bassuk 2003). "Obesity accounts for more than 280,000 deaths annually in the United States and will soon over-take smoking as the primary preventable cause of death if current trends continue" (Allison, Fontaine,

[1] I will use the term "Black" and African American interchangeably.

Manson, and Stevens 1999). Americans as a whole are steadily increasing their body weight. Currently two in three U.S. adults are overweight or obese (Flegal, Carrol, Ogden, and Johnson 2000). This condition is disproportionately prevalent in certain minority groups in America, and Black women are at the forefront of this pandemic (Centers of Disease Control (CDC) 2002). See Tables 1 and 2.

Table 1

Increase in Overweight (BMI $\geq$ 25) Prevalence Among U.S. Adults (Ages 20 to 74) by Racial / Ethnic Group and Gender

Racial / Ethnic Group	Men Prevalence (%)		Women Prevalence (%)	
	1988 to 1994	1999 to 2000	1988 to 1994	1999 to 2000
Black (non-Hispanic)	58.2	60.1	68.5	78
Mexican American	69.4	74.4	69.6	71.8
White (non-Hispanic)	61.6	67.5	47.2	57.5

Source: CDC, National Center for Health Statistics, National Health and Nutrition Examination Survey. Health, United States (Table 70) 2002.

Table 2

Increase in Obesity (BMI ≥ 30) Prevalence Among U.S. Adults (Ages 20 to 74) by Racial / Ethnic Group and Gender

Racial / Ethnic Group	Men Prevalence (%)		Women Prevalence (%)	
	1988 to 1994	1999 to 2000	1988 to 1994	1999 to 2000
Black (non-Hispanic)	21.3	28.8	39.1	50.8
Mexican American	24.4	29.4	36.1	40.1
White (non-Hispanic)	20.7	27.7	23.3	30.6

Source: CDC, National Center for Health Statistics, National Health and Nutrition Examination Survey. Health, United States (Table 70) 2002.

Many researchers have concluded that socioeconomic status (SES) is a major factor in the higher prevalence of overweight and obesity among African-American women. A study by Zhang and Wang[2] (2004) found that Blacks do not have lower SES in all demographic groups, however, and further research is needed to fully understand the mechanisms that cause inequality in obesity rates.

Measure of Overweight and Obesity

The terms overweight and obese are often considered synonymous. The confusion may lie in the fact that anyone who is obese is indeed overweight but being overweight does not necessitate obesity. Overweight refers to an excess amount of body weight that includes muscles, bone, fat, and water in relation to ones height; obesity is an excess amount of adipose tissue or body fat, which a person's Body Mass Index (BMI) can determine (CDC 2003).

[2] This study is explained in further detail in the Literature Review.

Body Mass Index (BMI)

Body Mass Index is calculated using a mathematical formula based on a person's height in inches or kilograms divided by weight in pounds or meters squared, times a constant of 703 if inches and pounds are used. A BMI of 18.5-24.9 represents normal weight. Anything equal to or less than 18.5 is under weight. Individuals with a BMI of 25-29.9 are overweight; those with a BMI of 30-34.9 are "Class 1 Obese". A BMI of 35-39.9 is "Class 2 Obesity" and anything equal to or greater than 40 is "Class 3, Extreme Obesity". BMI is the medical standard for measuring and differentiating overweight and obesity (CDC 2003).

While overall the BMI measure may be useful in determining one's risk for specific weight-related health problems, it has some limitations. For example, BMI may not be an accurate indicator of total body fat for individuals with high muscularity, muscle wasting, or persons less than five feet tall. For those persons who are very muscular, BMI overestimates body fat. For example, a body builder may be categorized as overweight using the BMI when they are not overly fat. People who are less than five feet tall may have high BMIs that may not reflect overweight or fatness. In addition, the elderly often lose lean muscle mass and have more fat for a given BMI than younger people.

The-Waist-to-Hip Ratio

The medical field also uses waist circumference measurements to determine the distribution of body fat. This is when there is an excess amount of body fat in relation to

the proportion of total body fat. Women with measurement of 35 inches or greater and men with 40 inches or greater have been associated with increased health risk. Currently the waist-to-hip (WHR), which is the quantification of the fat distribution, is used. This is the ratio of a person's waist to hip circumference. The waist circumference divided by the hip circumference constitutes the WHR. A waist-to-hip ratio of 1.0 or greater puts both men and women at risk for undesirable health consequences. Men should have a ratio of .90 or less and women .80 or less.

This study uses BMI to measure body weight. Body Mass Index is widely used and accepted as a valid measure to determine individual weight categories: underweight, normal, overweight, and obese. According to the Center of Disease Control (2003), it is the most commonly used measure of obesity.

Thesis Overview

The framework of this research is based on the assertion that biology alone does not account for the health differences that currently exist between Black and White women. Therefore, my research is conducted from a sociological point of view and guided by the conceptual framework of the intersectionality of race, class, and gender as it relates to the unique position of Black women in the United States.

I explore which factors contribute to overweight and obesity among Black and White women through a review of the literature on this subject and how factors that ultimately explain and/or determine the difference in prevalence through an analysis of the 2001 National Health Interview Survey. The literature review addresses six

categories of factors that contribute to obesity. Overall contributors are explained in the first section of the literature review followed by factors related to racial differences. The summary of the literature includes factors I address in this study given the existing data.

I analyze relative effects of the available independent variables from the 2001 National Health Interview Survey (NHIS) that are listed in the literature on racial differences in overweight and obesity. BMI, which is listed in the NHIS, is used as the dependent variable. Multiple regression iss used to determine the relative contribution of these variables to overweight and obesity among Black and White women in the 2001 NHIS data set.

Theoretical Framework

Explanatory theories concerning the racial health gap and more specifically, disparities in overweight and obesity among Black and White non-Hispanic women, are varied. However, social scientists have persistently argued that matters of race are primarily complicated by matters of social class (Williams and Collins 1999). In this section, I address frameworks that emphasize biological differences in race, and those that view race as a social construction. Finally, I provide an overview of the framework for this study, one that focuses on social constructions of race, class, and gender as interconnected, and the unique position of Black women in the U.S. and the connection to health.

Nature vs. Nurture

In recent years researchers have argued that more attention must be given to definitions of the concept of race and why it is related to health status. They emphasize that our fundamental assumptions about defining race will shape the research questions developed to understand racial disparities in health (Dressler 1993, King and Williams 1995, Williams et al. 1994). Historically, explanations for differences in health among racial ethnic groups focused on biological distinctions between those groups. Cooper and David (1986) argue that the validity of the biological concept of race is questionable on purely scientific grounds. The biological approach views racial taxonomies as meaningful classifications of genetic differences between human population groups (Williams and Collins 1999). Current research concerning this matter has shown that

racial groups are more alike than different in terms of biological characteristics and genetics, and no specific scientific criterion is able to distinguish different racial groups.

Diseases that have a clear genetic basis, in which gene frequencies are known to differ between racial groups, account for a small portion of racial disparities in health. For instance, sickle cell anemia in Black Americans accounts for three tenths of one percent of the total number of excess deaths in the Black population (Cooper 1984). Racial differences in biology cannot be viewed as the primary cause of variations in heath and disease, such as overweight and obesity.

Race, gender, and socioeconomic status all play a part in the genetics versus social causes debate. Genetics alone cannot account for the significant increase in the percentage of Americans, particularly Black Americans, who are obese. Recent research (reviewed below) shows that social class measured by income and education can be more powerful than genetics in predicting future health problems, including obesity. Socioeconomic status continues to be a remarkably robust determinant of variations in the rates of illness and death (Williams and Collins 1999). SES differences between racial groups are largely responsible for the observed patterns of racial disparities in health status and consequently overweight and obesity.

Race, Class, and Gender

With regard to health, the influences of race, gender, and often social class interact in ways that result in poorer health for Black women than for White women. Understanding the intersection of race, class, and gender is essential because these social locations are deeply embedded in the structure of social institutions such as work, family,

and education. Human relationships, identities, social institutions, and social issues that emerge from within institutions, such as the racial health gap, are all shaped by the intersections of race, class, and gender.

Race

The connection of race and racism is a key component in understanding why race matters in any society, and in this case, the U.S. Racism is a system of power and privilege; it can be manifested in people's attitudes but is rooted in society's structure and is reflected in the many advantages and disadvantages that groups experience based on their location in society (Andersen and Hill-Collins 2004). Racism in society's social structure is institutionalized racism, which allows for certain groups of people to benefit from a system that is organized through privilege and oppression. Individual experiences with race and racism are framed by particular locations in the overall system of race, class and gender privileges and penalties. "Race possesses not only objective dimensions that result from institutional racism; it also has subjective dimensions that relate to how people experience it. For example, some people of color have class privilege; yet this does not eliminate racism… (2004:85)".

Social Class

The intersection of race and gender is quite evident in class. For example, men have higher incomes in comparison to women of the same racial groups. In addition, Whites have higher incomes compared to other races. Social class is deeply embedded in the social structure of the United States. It shapes identity and individual experiences.

"Class is a system that differentially structures group access to economic, political, cultural, and social resources (Andersen and Hill-Collins 2004:86)." Social class as it exists today was founded upon America's pattern of patriarchal and capitalist development, and those patterns intersect with race and gender. Power, or lack thereof, is an essential component in social class. In a patriarchal society men have most of the power. In a racist and patriarchal society, White men have the great majority of the power. Those groups with power have the ability to dominate and influence others, not just interpersonally but structurally. In relation to this study, social class can act as a barrier in accessing knowledge/education about healthy body weight, as well as determine healthy food choices.

Gender

Gender is also deeply rooted in social institutions, which place men and women at different positions of advantage and disadvantage within society. Sexist ideology, the belief that men are superior to women, supports gendered patterns in society. This ideology is rarely expressed overtly, but is evident in the daily experiences of women and men and in the lack of power women hold in the U.S. Race and class are always present, in addition to the influences of instutionalized racism, sexism, and power relations. Andersen and Hill-Collins (2004) call attention to the concept of gendered institutions, which encompass all gender relations, beyond individual ideologies and interpersonal relationships. The United States is a gendered society with gendered institutions.

> The gap between women and men's income has closed, although most analyst agree that the narrowing of the gap reflects a drop in men's wages more than an

> increase in women's wages. Most women remain concentrated in gender-segregated occupations with low wages, little opportunity for mobility, and stressful conditions. This is particularly true for women of color. Women heading their own households are more likely to be in or below poverty level (2004:96).

The Position of Black Women in the US

The intersection of race, class, and gender in the lives of Black women in the U.S. places them at economic and health risks.

> The litany of health problems which plaque African American women at rates disproportionate to their percentage of the US population is familiar: hypertension, lupus, diabetes, maternal mortality, cervical cancer, etc. Of these problems, the success rate in terms of maintenance (in cases of chronic diseases) and cure (in cases of episodic illness) is affected by the constant circumscribing effect of being an African American female in a White, patriarchal, racist society (Barbee and Little 1997:402).

Beale (1970) explained the position of Black women in society with the phrase "double jeopardy." Black women not only face racism, but sexism as well. They lack access to authority and resources in society and are in structural opposition with the dominant race/ethnic group and the dominant sexual group (Lewis, 1977). In her exploration of Lewis's double jeopardy and triple jeopardy (racism, sexism, classism), King (1998) noted that the importance of any one factor in explaining Black women's circumstances varies and is dependent upon the particular aspect of life under consideration and the reference group to whom African American women are being compared.

This study is guided by the intersectionality framework in the following specific ways: (1) a two-part literature review that provides an understanding of how and why

certain factors contribute to the racial differences in overweight/obesity among Black and White women; and (2) an analysis that seeks to examine the socially constructed contributors to overweight and obesity that are unique to the position of African American women.

The literature review is divided into two parts to first address overall contributors of overweight and obesity regardless of race followed by factors specific to race, and for the purposes of this study, African American women. Being of African descent alone does not increase the risk of overweight and obesity. The minute biological differences between Blacks and Whites do not explain the higher prevalence of this particular health problem or the existing racial health gap in the U.S. Part two of the literature lists social factors that occur and are present due to the intersection of race, class, and gender. These factors also explain why Black Americans, specifically women, are at an increased risk and have a higher prevalence of overweight and obesity compared to White women.

The analysis examines the socially constructed factors that contribute to the differences among Black and White women, all of which are uniquely framed by the intersection of race, class, and gender in the U.S. The results of this study will also be discussed within this intersecting framework, focusing on the social disparities among Black and White women rather than their biological composition.

Literature Review

Researchers identify a number of contributing factors to overweight and obesity. In this section, I review this literature organized around the following categories of factors: biological, behavioral, environmental, psychological, social, and cultural factors. Each of these factors will be addressed from two perspectives: first as general overall contributors, and secondly by factors addressing racial differences among Black and White women. The only exception to this format is that biological factors are not listed in the literature as contributors to racial differences among overweight and obese persons. In addition, cultural factors are addressed only with respect to racial difference since culture is not addressed as an overall contributor to overweight and obesity in the literature.

Overall Contributors to Overweight and Obesity

Biological Factors

Researchers have identified several biological factors that influence overweight and obesity. The primary factors are energy imbalance, metabolism, genetics, and drugs/medications.

Energy Imbalance

Overweight and obesity are the result of an energy imbalance over an extended period of time. This energy imbalance occurs when the number of calories consumed is greater than the number of calories used. Otherwise, the result would be underweight. The human body needs calories for daily functions such as breathing, digestion, and daily activities. Weight gain occurs when calories consumed exceed this need (CDC 2005).

On the other hand, according to Roberts and Leibel (1998) there is no consistent relationship between weight gain and excess energy intake or deficient energy output. They suggest four possibilities for this inconsistency: sample size or methodological error, excess weight gain may occur only during certain widows of time, energy imbalance may be strongly influenced by prevailing environmental circumstances, and genes are likely to influence susceptibility to obesity.

Metabolism

According to the CDC (2005) the rate at which an individual's body burns energy is defined as metabolism. Metabolism rate varies across individuals; an individual may have a slower or faster metabolism than what is normal for a person of his or her size and age. A slow metabolism means that the body is more likely to store calories in the form of fat. The opposite is true of a faster metabolism. However, building muscle through weight-bearing exercise can speed up one's metabolism. Muscle burns more calories than fat, even at rest.

The term basal metabolic rate (BMR) is used when describing the rate at which the body uses energy when at rest. The greater an individuals body weight, the higher his or her BMR will be. The average BMR is about half a calorie per pound of body weight, per hour. For example, a person who weighs 140 pounds will burn approximately 70 calories an hour at rest.

Genetics and Other Health Problems

Stunkard, Foch, Hrubec's (1986) landmark studies revealed that both leanness and fatness are strongly inherited. Genetics can even influence the amount of fat stored and

where it is deposited in the body. Research has shown that a predisposition to obesity occurs when there is a mutation to single genes in the body. Gene mutation causes energy to be stored in the form of fat. Although there is a link between obesity and genes, mutations in single genes that result in severe obesity are quite rare. This mutation does not necessarily result in obesity. Persons predisposed to weight gain may require individual interventions to maintain a healthy weight; a combination of diet, medication, and physical activity is recommended (CDC 2005).

Some specific genetic conditions that cause or lead to obesity include Prader-Willi syndrome, Alström syndrome, Barde-Biedl syndrome, Cohen syndrome, Börjeson-Forssman-Lehmann syndrome, and Fröhlich syndromes are genetic disorders passed down from parent(s) (Aronne 2002). Additional health problems linked with obesity are hypothyroidism, Cushing syndrome, insulinoma, hypothalamic obesity, polycystic ovarian syndrome, growth hormone deficiency, hypogonadism, pseudohypoparathyroidism, oral contraceptive use are all associated with obesity (Aronne 2002).

Drugs/Medication

Certain medications may cause obesity. Primary examples include steroids, tricyclic antidepressants, phenothiazines, sodium valproate, carbamazepine, lithium, glucocorticoids, megestrol acetate, thiazolidine diones, sulphonylureas, insulin, andrenergic antagonists, and serotonin antagonists, especially cyproheptadine (Gunay-Aygun, Cissidy, and Nicholls 1997).

Metabolism, genetics, and drugs/medications are accepted biological contributors to overweight and obesity. However, energy imbalance is not. Weight gain as a result of calories consumed being greater than the number of calories used has been faced with some inconsistency. Each biological influence listed applies to all racial/ethnic groups.

Behavioral Factors

While researchers have identified a number of biological factors that contribute to overweight and obesity, a great number of nonbiological factors have been found to be important as well. In this section I address behavioral factors including physical activity, smoking cessation, and eating disorders.

Physical Activity

Physical activity plays a part in one's weight by using calories consumed to help keep the body's energy balance. Physical activity is any bodily movement produced by skeletal muscles that result in an expenditure of energy with a range of activities. Examples of physical activity can be anything from construction work to swimming to washing floors. Research by McMurray, Harrel, Deng, Bradley, Cox, and Bangdiwala (2000) on adolescents concluded that in males, participation in as little as one high-intensity physical activity three to five days a week decreased the risk of being overweight. However, for females, the risk for being overweight was not significantly altered by physical activity. These findings held true two years later. Gorden-Larsen, Adair, and Popkin (2002) found that the combined effects of high inactivity and low, moderate, to vigorous physical activity are particularly evident in boys. In their study, the predicted probability of overweight was nearly 15 percentage points higher for those

with high TV/video time and low, moderate, to vigorous activity. The comparable difference for girls was 7.9 percentage points.

Smoking Cessation

When a smoker quits smoking or decreases his or her number of daily cigarettes, weight gain sometimes results. There are two main reasons why smokers who quit gain weight. First, their metabolic rate decreases. Nicotine in cigarettes increases the metabolic rate of many smokers.

> Ex-smokers burn 100 to 200 fewer calories each day than they did when they smoked. Some researchers believe that nicotine causes the metabolic rate to rise by increasing the level of insulin in the blood, which decreases the body's ability to store fat. When nicotine is cut off, huger is triggered and fat storage is increased. Thus, the ex-smoker is faced with a change in metabolism that causes few calories to be burned, body fat to increase, and weight gain (Ensle 2004:1).

Secondly, smokers who quit may increase their food intake. They may feel hungrier due to the decreasing levels of nicotine in their body, since nicotine is an appetite suppressant.

Eating Disorders

Binge eating disorder[3] (BED) and night eating syndrome (NES) are associated with overweight and obesity, and each was first described in the 1950s by Stunkard (1959) and Stunkard, Grace, and Wolf (1955) in Geliebter (2002). Stuart and Laraia (2001) define an eating disorder as the use of food to satisfy unmet emotionally needs, to moderate stress, and to provide rewards and punishments. Eating disorders are often associated with a lack of control as well. BED occurs when large quantities of food are consumed fairly fast in private followed by feelings of guilt and depression from

[3] BED is explained in further detail under the topic of *Psychological Disorders*, because there are emotional factors associated with BED.

overeating (Tyler 2003). NES comprises skipping breakfast, consuming most food in the late evening and at night, and insomnia associated with either falling or staying asleep (Stunkard, Berkowitz, Wadden, Tanrikut, Reiss, and Young 1996).

The eating disorder NES is found in about fifteen percent of obese patients seeking treatment (Stunkard et al. 1996), yet little research has been conducted on this condition. A study by Birketvedt, Floreholmen, Sundsfjord, Osterud, Dingues, Biler, and Stunkard (1999) found that individuals with NES have different behavioral, psychological, and biological characteristics compared to obese individuals without NES. From six o'clock p.m. to after midnight, the NES group in their study began a rapid consumption of food. Additionally, the mood of the NES group was lower during the morning and it fell significantly more during the evening and night. The researchers also found evidence of differences in hormonal levels. The NES individuals had lower nighttime serum melatonin, which normally helps maintain sleep. They also had a smaller nighttime rise in lepitin, an inhibitor of food intake. Finally, they had higher cortisol levels, which could contribute to increased hunger.

The behavioral factors discussed above are related to overweight and obesity in different ways. Physical activity acts a preventative measure for adolescent boys, but not girls. Smoking is an appetite suppressor; former smokers may increase food consumption, in addition to developing a slower a metabolism. Lastly, the over consumption of food is a known contributor especially for those with low metabolism and time specific food consumption.

Environmental Factors

Researchers have found that the environment in which one lives influences daily life-style choices that can contribute to overweight and obesity. Not all environments are conducive to healthy living. For example, urban communities tend to have more fast food restaurants within walking distance. It may be more convenient to buy cheap fast food meals as opposed to cooking. In rural communities the opposite is typically true. Individuals may need a vehicle to go to the nearest fast food restaurant, which can act as a deterrent.

> Environmental factors may impact the daily physical activity of many Americans. For example, a person may choose not to walk to the store or work because of a lack of sidewalks. Communities, homes, and workplaces each shape health decisions. With fewer options for physical activity and healthy eating, it becomes more difficult for people to make good choices (CDC 2003).

The environment in which one lives influences daily life choices. Healthy lifestyles are structured, learned, and observed, primarily in one's immediate surroundings. If a particular environment is conducive to healthy living it can increase the likelihood of positive health choices, which may decrease the likelihood of becoming overweight. On the other hand, if the environment is not conducive to healthy living, it can contribute to unhealthy choices.

Psychological Factors

Psychological factors that partner with the body's biological makeup are discussed in this section. These factors provide explanations for individual behaviors and lifestyle choices. They relate to one's overall health and, specifically, overweight and obesity. Here I address psychological factors, which include stress, depression, and

depression as is relates to Binge Eating Disorder. The overall trends present different sex-specific results. Studies on suggest that stress and depression as it relates to body weight affect women more then men. The research on the association of eating disorders and obesity do not reveal a difference between men and women. However, women primarily suffer from eating disorders.

Stress

Although studies of stress as a risk factor for obesity are limited, those that have been conducted suggest that the two factors are related (Rohrer and Rohland 2004). When the body is stressed, it releases the stress hormone, cortisol. Under normal circumstances, cortisol is a useful and vital hormone, which is responsible for the metabolism of carbohydrates, proteins and fats and the regulation of the immune system. Cortisol prepares the body for defense against threat, by making glucose and fatty acids for extra energy. Cortisol becomes harmful when stressful events become chronic. Living with chronic stress constantly keeps cortisol levels elevated. The body believes it is about to run or fight, when in actuality, individuals are stressed over troubles. The body continues to produce high levels of cortisol while sitting or lying in bed. The excess cortisol stimulates the appetite and causes cravings for sugar, carbohydrates, and fatty foods that deliver energy quickly. Excess cortisol also causes the secretion of insulin. Insulin stores fat in preparation for an emergency. However, most of it is stored in the abdomen, where there is an abundance of stress hormone receptors. Particularly for those over age thirty, this is especially a problem, because the body no longer

produces sex hormones that help prevent the depositing of fat in the abdomen (Winnie Yu 2003).

Interestingly, sex-specific studies have not confirmed the relationship between stress and obesity for all groups. Specifically, Brunner (1997) used the 14-point Perceived Stress Scale (Cohen 1983) to study the association of obesity and stress among five hundred adults and found that higher Perceived Stress Scale (PSS) scores were significantly positively correlated with BMI for men, but not for women.

Depression

Depression has been linked to overweight and obesity. According to Roberts and colleagues (2003) there are four current hypotheses in respect to the association between obesity and depression. First, obesity increases the risk of depression. Second, depression increases the risk of obesity. Third, there is a reciprocal relation, such that people who are obese are at increased risk of depression and those who are depressed are at increased risk of obesity. Fourth there is no association between obesity and depression. Consequently, the researchers' objective was to determine which of the four hypotheses were supported by their data. The researchers determined that depression is associated with increased risk for obesity. Longitudinal research conducted on five hundred obese and non-obese adults showed a significant relationship between depression and weight (Miller and Harrington, 1997). An additional study found that obesity was associated with worse perceived mental health, more pessimism, and lower satisfaction with life (Roberts, Strawbridge, Deleger, and Kaplan 2002). Again there is some discrepancy among findings when sex differences are explicitly addressed. For

example, Carpenter, Hasin, Allison, and Faith (2003) used data from a large national sample from the United States and concluded that obesity was associated with an increased risk of depression and suicidal ideation among women but not men.

In a study by Onyike, Crum, Hochang, Lyketsos, and Eaton (2003) the prevalence of depression was highest in women with severe obesity (BMI ≥40).

> We found that the association between obesity and depression depends on the severity of the obesity. Obese persons had an approximately 1.5-fold higher prevalence of past month depression than their normal-weight counterparts. Among women, obesity was associated with 82 percent higher odds of past-month depression; the same estimate of 73 percent higher odds in men was not statistically significant (Onyike et al. 2003:1143).

Additional studies report that the relation between obesity and depression differs for men and women. Faith, Flint, Fairburn, Goodwin, and Allison (2001) found a positive relationship between depression and obesity among women but not among men. Carpenter et al. (2000) determined that obesity in women was associated with a *thirty-seven percent* increase in major depression, whereas among men, obesity was associated with a *thirty-seven percent* decrease in major depression.

Depression and severe obesity has also been studied in adolescents. In a review of depression and obesity, Stunkard, Faith, and Allison (2003) analyzed the National Health and Nutrition Examination Survey (NHANES)-III data to address the relationship between severity of obesity and the prevalence of major depression. Among the leanest adolescents, ages fifteen to nineteen, depression was uncommon and, in fact, nonexistent among the leanest boys. Among the most obese adolescents, in the ninty-fifth to one-hundredth percentile, the prevalence of major depression increased to highly significant

levels, twenty percent for boys and thirty percent for girls. Thus the relationship between body weight and depression levels depended on the degree of obesity in both sexes.

Some research in this area has also yielded a nonexistent relationship between depression and obesity. Hallstrom and Noppa (1981) studied women ages thirty-eight to fifty-four and found no association between obesity and present or past mental illness (including anxiety, phobias, depression, contact with psychiatrists, or use of psychotropic drugs). Palinkas, Wingard, and Barrett-Connor (1996) found that obesity was not related to risk for depression in women ages fifty to eighty-nine. Another study using the mental health measure found no overall association between obesity and mental health functioning (Han, Tijhuis, Lean, Seidell 1998).

In recent literature by Fabricatore and Wadden (2004), the following information was concluded. Contrary to common stereotypes and assumptions, obesity is not strongly associated with depression or any abnormal personality characteristics. Psychological traits are more widely varied within the population of obese persons than between obese and nonobese individuals. As with people of average weight, certain factors appear to increase the risk of psychopathology among obese persons. Obese females, binge eaters, and extremely obese persons are at increased risk for emotional disturbance. Recent research has attempted to discover whether excess body weight is a risk factor for depression, or whether mood disturbances predispose to obesity. Among adolescents, it seems that depression is related to obesity later in life; in older adults, obesity precedes depression. Psychopathology in an obese person requires the same treatment that would be provided to a person of average weight. Despite some evidence of a relationship

between the two, weight loss is not an empirically supported treatment for major depression or other psychiatric conditions.

Depression and Anger as it Relates to Binge Eating Disorder

Researchers have examined the link between emotional factors and Binge Eating Disorder (BED). Fassino, Daga, Leombruni, and Rivera (2002) evaluated the anger levels and their management in fifty-one obese women with BED and fifty-two without obese BED. Participants were assessed with the State-Trait Anger Expression Inventory (STAXI), Beck Disorder Inventory (BDI), and Eating Disorder Inventory-2 (EDI-2). Their results yielded four major findings. First, obese individuals with BED have greater degrees of depression and a more severe eating-related psychopathology compared to obesity without BED. Second, obese binge eaters show greater levels of hostility, criticism, and externalized anger. Third, there is a greater tendency toward anger suppression among obese people with greater depression levels regardless of whether or not they are binge or non-binge eaters. Finally, anger is strongly correlated with impulsivity among obese binge eaters. Chua, Touyz, and Hill (2003) found similar relationships between negative emotions and BED. During their session interviews, all forty participants (obese binge eaters) identified mood as a trigger to their binge eating. Thirty-nine named negative mood states as triggers. The most common prebinge mood was depression or sadness.

Each of the factors discussed above is associated with overweight and obesiy. Stress can have a physiological effect on the body, which can increase body weight through the release of the hormone cortisol. Depression as it relates to obesity is gender

specific. It is associated with an increased risk for obesity and present among women only. The examination of adolescents concludes that the relationship between body weight and depression depends on the degree of depression. Childhood depression is related to obesity later in life. The association between depression and obesity is fraught with discrepancies. Some studies report no association between depression and body weight, while obese persons with BED have greater degrees of depression in addition to externalized anger. Furthermore, anger was found to be a major trigger to binge eating episodes.

Social Factors

The identification and function of social factors are important to this study. The United States is a society organized around unequal distribution of power, and as a result, the health of women has been compromised. America is founded on the belief that anyone can "make it" and opportunities seem endless as long as you apply yourself and work hard. The "American Dream" is not attainable for everyone. Because of this embedded belief system in the American Dream, social problems are often perceived as individual problems. One may think unhealthy women have made poor lifestyle choices, when in fact social factors may very well have determined and largely influenced what appear to be individual circumstances of life choices.

> Poverty, the lack of power, racial discrimination, the gendered division of labor, and the devaluing of women all affect a woman's health. Women are exposed to different occupational conditions than men are, encounter more violence in the home, and have an increased risk of various health problems due to their relatively greater impoverishment (Ratcliff 2002:7).

When subgroups of the population, like Black women, share common experiences, social factors must be explored, as I intend to do in this study.

Heath Insurance

The American Obesity Association (2004) addressed the impact of health on obesity. They note how the countless numbers of insurance plans and ever changing policies have made it difficult to assess the extent to which obesity treatment and prevention services are available. Many insurance plans do not provide reimbursement for weight loss treatment. The Pharmacy Benefit Management Institute reports that appetite suppression products have been excluded by more than eighty percent of employers, according to a sample of 375 companies representing almost twelve million beneficiaries, in 1998. This represented the third year that the exclusion rate was above eighty percent (AOA 2002).

In my review of the literature, only one study (Hass et al. 2003) specifically observed the association of health insurance and obesity, and another study supported the findings by listing overweight as a risk factor for developing chronic diseases. Fine, Philogene, Gramling, Coups, and Sinha (2004) examined risk factors for chronic disease. The four common factors were cigarette smoking, risky drinking of alcoholic beverages, physical inactivity, and overweight. All of these health problems contribute substantially to chronic disease. Fine and colleagues found that individuals with no health insurance coverage had higher risk factors than those with public or private health insurance. Therefore, women without health insurance have higher risk factors for overweight compared to those who do.

Hass, Lee, Kaplan, Sonneborn, Phillips, Liang (2003) explored the association of health insurance status with the prevalence of overweight during childhood and adolescence. Hass and colleagues used data from the 1996 Medical Expenditure Panel Survey, Household Component. They found that the lack of health insurance is positively associated with the prevalence of overweight among adolescents. Results showed that between the ages of six and eleven, health insurance status was not associated with overweight. However, between the ages of twelve and seventeen, having private health insurance demonstrated a protective factor against overweight. In addition, adolescents with public insurance were more likely to be overweight than children with private insurance. Hass and colleagues concluded that their findings suggest the importance of health insurance for the prevention and treatment of adolescent overweight.

The U.S. is a capitalist society, which does not provide universal health care coverage. Adolescents are impacted by this particular social factor by no individual choice of their own.

Summary

Overall, weight gain occurs when there is an energy imbalance. The bottom line is that when people overeat or eat unhealthy foods, the body does not have an equal energy balance, which will likely result in weight gain. Attempts to explain why this occurs and affects some groups more than others have resulted in some disagreement among researchers. Some studies have shown that genetics strongly influence the risk of

overweight/obesity and the energy imbalance is influenced by additional factors related to certain gender groups.

Psychological influences such as stress and depression have been shown to increase the risk for overweight and obesity and/or have a reciprocal relationship among women and adolescent girls, but not among men and adolescent boys. Physical activity among adolescents used as a preventative measure to overweight and obesity is significant among boys and not among girls. Health insurance is positively associated with the prevalence of overweight among adolescents. It is especially important for those ages twelve to seventeen; private health insurance demonstrates a protective factor against overweight.

Factors Addressing Racial Differences in Overweight and Obesity among Black and White Women

This section provides race-specific factors related to overweight and obesity. Overall contributors do not explain the racial differences that exist. Factors will be addressed in the following order: psychological, social, and cultural. African American women, as a result of their unique position in the U.S., experience and cope with daily life differently than do their White counterparts. These differences are explored in the literature below.

Psychological Factors

Psychological factors among Black women as they relate to body weight are stress as well as distress. The literature suggest that stressors faced by African American women are unique to their position in the U.S. and are also in response to overall social problems such as economic concerns, which are often experienced as individual issues.

Stress and Distress

As addressed above, stress has been found to be associated with obesity. Studies of stress as a risk factor for obesity are limited (Rohrer and Rohland 2004). However, studies have linked stress with other psychological factors like racism and sexism, which are discussed below. Hargrove and Keller (1993) found relationships between stress and weight control behaviors based on interviews with Back women. These women reported living with stress from single parenting, financial concerns, lack of support, and an inability to accomplish goals. The respondents reported that they would eat unhealthy fast and fried foods in response to stress.

Walcott-McQuigg (1995) discovered a correlation between stress and weight control in a sample of thirty-six African American women using interview data and the 14-point Perceived Stress Scale (Cohen 1983). The results showed that women with higher levels of stress were more overweight and participated less in weight control behaviors. Lifestyle was consistently reported as a primary cause of stress. Over half of the women in this study identified themselves as stress eaters i.e. those who eat when they are stressed. Challenging this finding, Brunner (1997), also using the Perceived Stress Scale (PSS) to study the association of obesity and stress among five hundred adults, found that higher PSS scores were significantly positively correlated with BMI for men, but not for women. Only seven percent of study participants were African American, and no specific observations were made concerning Blacks and the relationship between stress and obesity.

The literature on racism, sexism, and obesity is not vast. Nonetheless, empirical studies linking sexist and racist social structures to psychological distress have reported consistent findings. Black women experience higher percentages of perceived racism and sexism compared to White women, which relates to greater psychological distress (Moradi and Subich 2003). Individuals who experience repeated stressful events are at risk for developing physical and psychological illness (Outlaw 1993).

Racism and sexism on the job have been identified as major stressors among Black women (Walcott-McQuigg, Sullivan, Dan, and Logan 1995). Furthermore, perceived racist events are related positively to a range of psychological symptoms and overall psychological distress (Klonoff and Landrine 1999). Consistent with previously

reviewed literature, Moradi and Subich (2003) showed that zero-order correlations of recent racist and sexist events to psychological distress were significant and positive, indicating that greater frequency of perceived racist and sexist events was related to higher levels of psychological distress.

Social Factors

Social factors associated with body weight among African Americans are discussed in this section. There are four subtopics: diet, environment, health insurance, and socioeconomic status. First, the traditional Black American diet is explained and connected to the influence of environment. Second, the section on health insurance provides statistics and trends, to be read and understood in the context of the overall impact of health insurance as mentioned in part one of the literature. Lastly, the general trend of influences of socioeconomic status on overweight/obesity has shown higher BMI for those with lower SES. However, as discussed below, there are exceptions among certain subgroups of the population.

Diet

African Americans and Whites do not have the same diets. Many of the differences have been linked to slavery, which has shaped the cultural food patterns. However, this report will concentrate on the present day differences. African American food habits are described as a U.S southern diet (Veale-Jones and Darling, 1996). Blacks tend to utilize a particular preparation style that includes frying meats, stewing or boiling vegetables, using pork as seasoning, and using excess sugars in desserts and drinks (Kittler and Sucher, 1998).

> The Food Guide Pyramid (See Appendix I) is currently being used as a guideline of what to eat each day. Using the Food Guide Pyramid, Blacks as a whole consume fewer servings of grain products, whole grains, vegetables, fruits, and dairy products. African Americans eat more foods from the meat group and added sugars compared to Whites. When milk is consumed by Blacks it is more likely to be whole milk, opposed to low-fat or skim milk. Black men and women have a diet that consists of more dark green leafy vegetables than White's diets, but fewer dark yellow vegetables and fewer lettuce-based salads. Even beverage consumption differs among Black and White women. Black women are more likely than White women to drink regular carbonated drinks and much less likely to consume low-calorie carbonated drinks. Thus, the nutrient intake of Blacks and Whites is unequal. Generally speaking, African Americans have a higher consumption of total fat, saturated fat, and cholesterol, lower consumption of fiber, calcium, potassium, and higher consumption of carotenes (found in dark green vegetables) (Kumanyika and Odoms 2001).

Clearly the typical diet of African Americans relates to overweight and obesity.

Environment

Environmental factors such as the community in which one lives can affect food consumption. More than half of the Black population lives in central cities, compared to fewer than one-quarter of non-Hispanic Whites (Pollard and O'Hare, 1999). Central cities lack major supermarket chains, which can result in a greater dependence on smaller convenience stores for goods and services, higher prices, and often lower quality and less healthy foods (Brown, 1999). There are also more fast food restaurants in cities, which can also influence food selection.

Health Insurance

Preliminary data from the 2001 National Health Interview Survey (NHIS) showed that for adults ages 18 to 64, the overall percentage of those who were uninsured decreased significantly from 18.9% in 1997 to17.8% in 1999, and since then there has not been significant change. However, this pattern was only seen in non-Hispanic White

adults ages 18 to 64, not among Hispanic adults and Black non-Hispanic adults of the same ages. There was no consistent corresponding increase in the percentage of public health plan coverage for all three racial/ethnic groups; it is only true for non-Hispanic Whites.

Socioeconomic Status

According to the American Obesity Association, 2004, women and people of low SES within minority populations appear to be particularly affected by overweight and obesity. SES is a major predictor of dietary intake (Braithwaite and Taylor 2001). African Americans are disproportionately represented among the low-income segment of the population, and low SES has been linked to a variety of dietary or nutrition problems.

Stunkard, (1993), in his commentary on obesity and socioeconomic status, stated three possible relationships: 1) obesity influences SES, 2) SES influences obesity, or 3) a common factor or factors influence both obesity and SES. He believed that either could influence the other but other factor(s) may influence both obesity and SES. Strong new evidence for the relationship between obesity and socioeconomic status was first reported by Gortmaker et al. in 1993. Their study was based on a longitudinal survey of a national probability sample of 10,039 participants, ages sixteen to twenty-four. Participants were examined in 1981 and again in 1988. Gortmaker and colleagues found that overweight women had lower incomes and completed fewer years of school. Additionally, their incomes were more likely to be below the poverty line. Similar but weaker trends were found among men.

Averett and Korenman (1999) investigated social and economic effects of obesity for Black and White women and explored possible explanations for race differences in obesity effects. They looked at obesity differentials in marriage and employment outcomes for women, with specific focus on differences between African American and White women. Their results reported that according to all indicators, obese women have a lower attained socioeconomic status than women of recommended weight. Lower family income, spouse's earnings, hourly wages, and the percentage with managerial/professional occupations are associated with higher BMI categories. For African Americans only, no employment is associated with higher BMI categories. Years of schooling and Armed Forces Qualifications Test (AFQT, a test of academic ability and achievement, administered in 1980) scores were also lower. Results also

reported that obese White women are somewhat less likely to have children and less likely to be married than their non-obese counterparts, whereas obese Black women are less likely to be married, but not less likely to have children.

Robert and Reither (2004) included community disadvantage along with socioeconomic status in explaining the higher body mass index of Black adults in the U.S. Their results showed that living in communities with higher socioeconomic disadvantage was associated with higher BMI net of age, race, individual SES, smoking, physical activity, stress, and social support when gender was controlled for. Results for men demonstrated no statistically significant association between BMI and SES or community disadvantage. Their research showed, however, that race and low individual SES were each independent risk factors for higher BMI among women. Individual SES slightly reduced racial differences in BMI among women, with large racial differences in BMI persisting. Individual SES and community socioeconomic disadvantage each explained some of the association between race and BMI among women, yet strong race effects remained.

Zhang and Wang (2003) assessed SES inequality across gender, age, and ethnic groups in the distribution of obesity among American adults, ages eighteen to sixty years old with the use of what they termed the concentration index (CI). The concentration index provides a quantitative summary measure of socioeconomic inequality in obesity. Data from the National Health and Examination Survey III, 1988-1994 (NHANES III) were used. They found that SES inequality in obese persons varied dramatically across demographic groups. Zhang and Wang noted three patterns that occurred in the data.

First, large ethnic differences exist in the association between SES and obesity as well as in the magnitude of inequality. However, their research did not undeniably show that minority groups are more vulnerable to obesity than Whites in the U.S. In fact, their results indicate that minority groups do not necessarily have a higher SES inequality. For some demographic groups[4] the SES inequality among obese Whites was more severe than that among minority groups. Secondly, Zhang and Wang found a consistent reverse association between SES and obesity among both White women and men, and in all the White gender-age groups. In contrast, for Blacks and Mexican Americans, the association between SES and obesity varies by gender and age. A positive relationship between SES and obesity exists in minority men. Third, they found a strong inverse association between SES and obesity among White females especially in the young age group, but not among Black females. In conclusion, there is considerable SES variation in obesity among the U.S. population and the patterns vary substantially across gender, age, and ethnic groups.

Given recent increased attention to childhood and adolescent obesity in the culture at large, researchers have also studied the relationship between weight and SES among adolescents. Kimm, Obarzanek, Barton, Aston, Similo, Morrison, Sabry, Schreiber, and McMahon (1996) set out to examine the association between race, SES, and the prevalence of obesity, in nine to ten year old White and Black girls and their parents. Subjects were participants in the National Growth and Health Study (NGHS) of the National Heart, Lung, and Blood Institute. Their research indicated an association

[4] For example, White women ages forty to forty-nine.

between income and education in the prevalence of obesity among White girls, but not Black girls. A lower prevalence of obesity was seen at higher levels of SES in White girls. The same relationship was not observed among Black girls.

Similarly, McMurray et al. (2000) studied SES, ethnicity, and physical activity in relation to BMI. McMurray and colleagues used a sample of 2389 adolescents, ages ten to sixteen. Their results reported that both male and female African American and female adolescents in general, no matter the ethnicity, with low SES are more at risk for being overweight, regardless of their reported physical activity and time spent watching television. For females, high-intensity exercise was not significantly associated with weight status, but low SES, and African American ethnicity were important factors related to being overweight. Their study suggests that physical activity indicated by television viewing and video game playing effect weight status, because low SES adolescents report about twice the amount of time per day participating in these inactive behaviors.

Gordon-Larson, Adair, and Popkin (2002) examined the extent to which racial/ethnic differences in income and education account for sex-specific disparities in overweight prevalence in White, African American, Hispanic, and Asian U.S teens. They used representative data collected from the National Longitudinal Study of Adolescent Health. Gordon-Larson et al. (2002) found there was considerable ethnic disparity in adolescent overweight prevalence by SES, with a clear inverse relationship among White females. Some key findings were that overweight prevalence declined with increasing income among Whites. Overweight prevalence was lowest for African

Americans in mid-income levels, but highest for those with lowest and highest family incomes, with statistically significant African American and White differences at all income levels. Results were similar for the relationship between parental education and overweight. Females showed greater variability in overweight by parental education than males. African American females demonstrated significantly higher overweight than White females across all levels of parental education except the lowest level. For African American and Hispanic females, there was no statistically significant reduction in overweight prevalence with increasing SES.

Summary

Among Black women, studies report that the primary contributor of stress is lifestyle and distress as it relates to their unique position in the U.S. The traditional African American diet is not very healthy. Moreover, large portions of Blacks live in urban communities that are conducive to unhealthy diets.

Several studies have shown a relationship between low SES and obesity among minority women. Whether obesity influences SES or SES influences obesity is not clear. Data has also shown the two are independent risk factors among Black women. In the examination of SES inequality across gender, age, and ethnic groups research did not undeniably show that minority groups are more vulnerable to obesity than Whites in the U.S. Among adolescents low SES is associated with a higher risk for overweight and obesity regardless of race.

Cultural Factors

There are cultural factors in the African American community that impact body weight in this population. The European standard of beauty has not been completely accepted among Blacks as a whole. This section discusses literature concerning body preference and satisfaction among Black men and women in comparison to White men and women. Generally, African Americans have a larger ideal body size and greater acceptance of larger women compared to their White counterparts.

Body Preference and Satisfaction

The African American community is much more accepting than mainstream America of the full figured woman. Studies have consistently shown that Black women have higher positive body images than White women, even though African American women are more likely to be overweight. Rucker and Cash (1992) found that the perceptions of body size differ for Black and White women. White women demonstrated a greater fear of fatness, a stronger drive to be thin, more dieting concerns and overweight preoccupation, greater weight fluctuation awareness, and they perceived the same silhouettes as heavier. Kumanyika, Wilson, and Guiford-Davenport (1993) reported that Black women are less preoccupied with weight reduction than their White counterparts. Research conducted solely on Black women by Kumanyika and colleagues (1993) found that their respondents were less negative about obesity than might be commonly assumed based on data for White women. Black women did not perceive being overweight as synonymous with being unattractive. Yet, almost all the women in their sample who perceived themselves as overweight and wanted to be normal weight

range, were aware of obesity-related health risk, had been advised by health professionals to lose weight, and had tried to lose weight at some time in the past (Kumanyika, Wilson, and Guiford-Davenport 1993). Recent research is consistent with the previously mentioned literature. Results in a study conducted by Paeratakul, White, Williamson, Ryan, and Bray (2002), for example, suggested that White women were more likely than African American women to report that they were overweight.

This pattern of racial disparity in body satisfaction is also found among adolescent girls. Young African American women report more positive feelings about their bodies and are more likely to report being satisfied with their weight than are White women (Parker, Nichter, and Vuckovic 1995). Kemper, Sargent, Valois, and Hussey (1994) supported the Abrams, Allen, and Gray (1992) research. African American girls had significantly larger body ideals, were more satisfied with their body size compared to White girls, and saw themselves smaller than their ideal body size. Research by Strigel-Moore, Wilson, Wilfley, Elder, and Brownell (1998) had similar findings, and the thinnest Black girls in their study reported the most body dissatisfaction. Previous research based on data from the National Growth and Health Study found that thin Black girls were three times more likely than thin White girls to make deliberate attempts to gain weight (Schreiber, Robins, Strigel-Moore, Obarzaneck, Morrison, and Wright 1996).

Preference for larger body size among African American women also holds true among African American males. Thomas (1989) suggested that Black women's body image satisfaction was strongly related to the preferences of the significant men in their lives. Therefore, it is not just African American women who are fond of a larger body,

but African American men are too. In a study by Alcott-McQuigg, Sullivan, Dan, and Logan (1995) women reported that their husbands or partners preferred them larger, rounder or fuller (as opposed to too thin), or as one respondent put it, with "meat on my bones." Thomas, Sargent, and Kemper (1996) studied body preference among Black and White adolescent men. Black males significantly chose larger silhouettes, for women and men, compared to their White male counterparts. Another significant finding was that Black males showed a particular preference for larger hips and thighs for the ideal female body. Freedman, Carger, Sbrocco, and Gray (2004) also used similar techniques in their study of ethnic differences in preferences for female Waist to Hip Ratio[5] of African American and White American college students. Their results were consistent with previous research showing that African American males prefer a lower WHR compared to White males. Black males were more accepting of larger body sizes for women and disliked a low body weight for women more frequently than did their White counterparts.

Summary

According to the literature, there are racial factors at work in the higher prevalence of overweight and obesity among African American women in comparison to White non-Hispanic women. The overall consistent findings are as follows. First, generally speaking, the average diet of Whites is healthier than that of the average Black American's. The information provided on the impact of environment in relation to overweight/obesity would lead one to consider the possibility that the average environment of Blacks is less conducive to healthy living. Secondly, negative

[5] Waist to Hip Ratio (WHR) is discussed in the Introduction under section titled *Measure of Overweight and Obesity.*

psychological factors also impact African American women at higher levels that White women, such as stress and distress as a result of racism and sexism. The ideal body size, body preference and body satisfaction is different for Black women when compared to White women. Both African-American women and men are more accepting of the full figured women and prefer a larger frame (larger hips and thighs) compared to White women and men. Finally, Black women have a higher positive self image at higher weights compared to White women.

Low SES resulting in an increased risk or high prevalence of overweight and obesity is not without challenge. It has been found that age and gender must be considered. Among certain demographic groups, ages forty to forty-nine, the inequality among obese Whites was more severe compared to other minority groups.

This review of the literature suggests that the following contributors cause or are associated with overweight and obesity among Black and/or White women:

Biological

- Number of calories consumed exceed the number of calories used
- Slow metabolic rate
- Gene mutation
- Certain diseases and health problems, as well as drugs and medications

Behavioral

- Lack of adequate physical activity
- Smoking cessation

Psychological

- Binge Eating Disorder and Night Eating Disorder
- Stress and distress
- Depression

Social

- Urban environment

- No health insurance or insurance plans that lack coverage to prevent or treat overweight and obesity
- Low socioeconomic status

Cultural

- Poor diet
- Ideal body size, body preference, and body satisfaction that is not consistent with a healthy body weight

African American women have a higher prevalence of overweight and obesity compared to White non-Hispanic women. The examination of the factors listed above may provide some insight into why Black women are more likely to have a higher BMI than White women. Of these factors, I am able to address the following given existing data:

Behavioral

- Lack of adequate physical activity
- Smoking Cessation

Psychological

- Stress
- Depression

Social

- No health insurance or insurance plans that lack coverage to prevent or treat overweight and obesity
- Socioeconomic status

Methods and Data Collection

Research Design

This project is an exploration of contributing factors to overweight and obesity and the extent to which differences persist along racial lines, when controlling for other contributing factors, among Black and White non-Hispanic women in the U.S. I conducted secondary analysis using the 2001 National Health Interview Survey (NHIS). These are nationally representative data collected by the United States Department of Health and Human Services and the National Center for Health Statistics that are currently available to the public on the National Center for Health Statistics website, as well as through the Inter-University Consortium for Political and Social Research.

The National Health Interview Survey, 2001

The purpose of the National Health Interview Survey (NHIS) is to obtain information about the amount and distribution of illness, its effects in terms of disability and chronic impairments, and the kinds of health services people receive. Implementation of a redesigned NHIS, consisting of a basic module, a periodic module, and a topical module, began in 1997. These data consist of survey and clinical data that were obtained through personal interviews. The 2001 NHIS contains the Household, Family, Person, Sample Adult, Sample Child, Child Immunization, and Injury and Poison Episode data files from the basic module. This research was conducted using the Sample Adult file with a few variables added from the Family Data file.

The Family-Level File (Part 2) is comprised of reconstructed variables from the person-level data of the basic module and includes information on sex, age, race, marital status, Hispanic origin, education, veteran status, family income, family size, major

activities, health status, activity limits, and employment status, along with industry and occupation. A randomly-selected adult in each family was interviewed for the Sample Adult File (Part 4) regarding respiratory conditions, renal conditions, AIDS, joint symptoms, health status, limitation of daily activities, and behaviors such as smoking, alcohol consumption, and physical activity. Also included in this file are variables pertaining to the Healthy People 2010 Objectives, which I did not analyze in this study.

Sampling Procedures

The NHIS uses a stratified multistage probability design. The sample for the NHIS is redesigned every decade using population data from the most recent decennial census. A redesigned sample was implemented in 1995. This new design includes a greater number of primary sampling units, and a more complicated nonresponse adjustment based on household screenings and over-sampling of Black and Hispanic persons for more reliable estimates of these groups.

Variables and Operational Definitions

In this study, I have examined all of the available variables in the 2001 NHIS identified in the literature as contributing factors to overweight and obesity among Black and White non-Hispanic women.

Dependent Variable

BMI

Weight classifications were determined by using BMI. The data included the raw scores of BMI for each participant. Sample adults were asked to estimate their current height and weight. Body Mass Index scores were calculated using the formula: BMI =

weight in kilograms/height in meters squared. I have recoded BMI in terms of standard measures of underweight, normal weight, and overweight. A BMI of 18.5-24.9 represents normal weight. Anything equal to or less than 18.5 is under weight. Individuals with a BMI of 25-29.9 are overweight; those with a BMI of 30-34.9 are "Class 1 Obese". A BMI of 35-39.9 is "Class 2 Obesity" and anything equal to or greater than 40 is "Class 3 Extreme Obesity" (AOA 2002).

Independent Variables

Race/Ethnicity

I recoded a variable race/ethnicity variable designating two groups: *Non-Hispanic Black* and *Non-Hispanic White*. The questions used in the NHIS are below.

Do you consider yourself to be Hispanic, or Latino?

What race do you consider yourself to be?

Physical Activity

This statement preceded the questions on physical activity. *The next questions are about physical activities (exercise, sports, physically active hobbies...) that you may do in your LEISURE time.*

- *How often do you do VIGOROUS activities for AT LEAST 10 MINUTES that cause HEAVY sweating or LARGE increases in breathing or heart rate?*

Responses: Time Period – Never, Day, Week, Month, Year

If the respondent does any vigorous exercise (any valid response other than "never") then they were placed in the "yes" category.

Smoking Cessation

- *Have you smoked at least 100 cigarettes in your ENTIRE LIFE?*
  Responses: Yes, No

Stress (Emotional Support)

I recoded the responses of the question asked below for the variable stress: 1 = Always, 2 = Usually, 3 = Sometimes and 4 = Rarely or Never. In the analysis the variable stress is examined under the question, "How often do you receive emotional support?" As discussed in the literature, lifestyle is consistently reported as a primary cause of stress. Women reported living with stress from single parenting, lack of support, and financial concerns.

How often do you get the social and emotional support you need? Would you say always, usually, sometimes, rarely, or never?

Depression

I created an index using each of the questions asked below for this variable (alpha=.81). The original variables (below) were scored from 1 ("All of the time") to 5 ("None of the time"). High values on the index indicate high depression. The four component variables were summed to create the depression index, which ranged from a low of 4 (indicating high depression) to a high of 20 (indicating low depression). Then I recoded the index to decrease the number of values for the crosstabulation, but retain the basic essence of the variable. The responses were recoded in three categories: 1 (no

depression – original score of 20), 2 (moderate depression – original scores from 16 -19), 3 (high depression – original score from 4-15).

During the PAST 30 DAYS, how often did you feel...

- *...So sad that nothing could cheer you up?*
- *...Nervous?*
- *...Restless or fidgety?*
- *...Hopeless?*

Responses: ALL of the time, MOST of the time, SOME of the time, A LITTLE of the time, NONE of the time

Health Insurance

- *{Are you/Is anyone} covered by any kind of health insurance or some kind of health care plan?*

Responses: Yes, No

Socioeconomic Status

Socioeconomic status is examined through education and income.

Education

- *What is your highest level of completed education?*

Responses: 0-21years

Education was recoded into four categories: Less than high school, high school graduate or GED, Some college or AA degree, and College graduate.

Income

- *Now I am going to ask about the total combined income {for you/or your family} in {last year in 4 digit format}, including income from all sources we have just talked about such wages, salaries, Social Security or retirement benefits, help from relatives and so forth. Can you tell me that amount before taxes?*

- *Of those income groups, can you tell me which letter best represents {your total/the total combined FAMILY} income during {last year in 4 digit format}.*

Responses: Less than $1,000; $1,000-74,999 in intervals of $999.00; $75,000 and over

Income was measured as ratio of family income to the poverty threshold. The lower the decimal the closer those families surveyed are to poverty. Decimals from under .5 to .99 indicate an income below poverty level. Decimals 1.00 and over indicate an income at or above poverty level. I recoded this variable as three categories: under .5 to 1.99, 2.00 to 3.99, and 4.0 and over.

Statistical Analysis

I used version 14 of SPSS to conduct the analysis. I used bivariate crosstabulation analysis to examine the relationship between race and Body Mass Index (BMI). In a series of multivariate crosstabulations, I examined this relationship, controlling for factors contributing to obesity that were available in the NHIS 2001 data set. I also calculated bivariate correlations among all of the variables considered in the analysis. In my final analysis, I entered race and the contributing factors into a multiple regression equation simultaneously to determine the relative contribution of all of these variables to variation in BMI.

Results

This section reports the statistical analysis of the NHIS 2001 data set. Univariate, bivariate, and multivariate results are reported. As stated earlier the variables used are BMI, race/ethnicity, physical activity, smoking behavior, stress, depression, health insurance, and socioeconomic status.

Univariate

The reported data in Table 3 shows the distribution of BMI in the sample. Over half of these women (53%) were overweight and/or obese. Twenty-eight percent were overweight and 24% were obese. Only non-Hispanic Black and White women were analyzed in this study. Eighty-one percent of the analysis sample identified as White and 19% as Black. The average age for women in the NHIS 2001 data set was 48.54 years with a standard deviation of 1.10. About one-third (34%) of the analysis sample reported that they exercise vigorously. A little over half (57%) have never smoked 100 or more cigarettes. Six percent of the women in the data set rarely or never receive emotional support, while 45% always receive emotional support. Seventeen percent of the women in this data set had relatively high scores on the depression index and 43% had scores in a moderate range. Ninety-four percent of the women lived in a household where either they or family members were covered by some kind of health care plan. Thirty-one percent were high school graduates or obtained a GED. Thirty-one percent had some college/Associate's degree. Thirty-five percent of the women lived in a family with the lowest income (.5 to 1.99) levels, while 34% had incomes four times or more above the poverty level.

Table 3. Frequency of Variables

	Frequency	Percent
BMI		
Underweight/Normal	6730	47.5
Overweight	3990	28.2
Obese	3444	24.3
Total	**14164**	**100.00**
Age		
18-34	3924	26.0
35-49	4489	29.8
50-64	3242	21.5
64 and over	3412	22.6
Total	**15067**	**100.00**
Emotional Support		
Always	6665	45.0
Usually	5261	35.5
Sometimes	2008	13.6
Rarely or Never	883	6.0
Total	**14817**	**100.00**
Depression		
None	5938	40.4
Moderate	6265	42.6
High	2502	17.0
Total	**14705**	**100.00**
Education		
Less than HS	2366	15.8
HS graduate or GED	4614	30.9
Some college or AA degree	4567	30.6
College Graduate	3392	22.7
Total	**14939**	**100.00**
Ratio of family income to poverty threshold		
Under .5 to 1.99	3895	34.5
2.00 to 3.99	3563	31.6
4.0 and over	3832	33.9
Total	**11290**	**100.00**

Notes: BMI data was not available for 1096 women. Emotional support data was not available for 332 women. Depression data was not available for 461 women. Ratio of family income to poverty threshold data was missing for 4626 women.

Bivariate

The crosstabulation of BMI with race/ethnicity mirrored the literature. Slightly more than half, 52%, of all the White women in the data set were normal weight, as opposed to only about a third, 31% of Black women. The largest percentage of Blacks fell into the obese category at 37% compared to 21% among Whites. See Table 4.

Table 4. BMI Categories among White and Black Women

BMI	White	Black	Total
Under/Normal	51.6%	30.7%	47.5%
Over	27.2%	32.3%	28.2%
Obese	21.3%	36.9%	24.3%
Total	**100% (11,414)**	**100% (2750)**	**100% (14,164)**

γ=.355, p<.001

Table 5 reports the results of pairwise correlations between all variables used in the analyses.[6] BMI was negatively correlated with vigorous exercise (r=-.129), education (r=-.199), income (r=-.115), and smoking (r=-.036). As levels of exercise, education, and income increased, BMI decreased. Respondents who had ever smoked 100 or more cigarettes had lower BMIs than those who had not. BMI was positively correlated with depression (r=.068), emotional support (r=.081), health coverage (r=.015, n.s.), and age (r=.071). As levels of depression, emotional support, and age increased, BMI increased. Respondents who had health care coverage tended to have lower BMIs than those who did not. In agreement with the literature, race was positively correlated with BMI (r=.183), indicating that Black women tended to have higher BMIs than white women. All correlations with BMI with the exception of health coverage were statistically

[6] This analysis uses listwise deletion, thus including only cases that appear later in the regression analysis (N=10,646).

significant at $p<.001$. However, the magnitudes of these relationships were weak, and the number of cases in the analysis was high.

Table 5. Pairwise Correlations of BMI and Independent Variables Used in OLS Regression

	BMI	Vigorous exercise	Education	Income	Depression	Emotional support	Smoke	Health coverage	Age
BMI									
Vigorous exercise	-.124**								
Education	-.119**	.279**							
Income	-.115**	.222**	.422**						
Depression	.068**	-.015	-.082**	-.141**					
Emotional support	.081**	-.073**	-.090**	-.154**	.328**				
Smoke	-.036**	-.039**	-.106**	-.041**	.141**	.085**			
Health coverage	.015	.004	.067**	.156**	-.076**	-.064**	-.057**		
Age	.071**	-.278**	-.227**	-.061**	-.038**	.005	.042**	.113**	
Race	.183**	-.101**	-.147**	-.227**	-.024*	.051**	-.110**	-.044**	-.076**

*p<.01, **p<.001, one-tailed tests. Other correlations are not statistically significant at p<.05. N=10646.

Notes: Variable coding: BMI - 1=Underweight, 2=Normal weight, 3=Overweight, 4=Obese class 1, 5=Obese class 2, 6=Obese class 3; Vigorous exercise (Does respondent ever get vigorous exercise?) – 0=No, 1=Yes; Education - 1=Less than high school, 2=High school graduate or GED, 3=Some college or AA degree, 4=College graduate; Income (Ratio of family income to poverty threshold) - 1=Under .5 to 1.99, 2=2.00 to 3.99, 3=4.0 and over; Depression (Index ranging from 4-20) – 1=None (20), 2=Moderate (16-19), 3=High (4-15); Emotional support (How often get emotional support?) – 1=Always, 2=Usually, 3=Sometimes, 4=Rarely or Never; Smoke (Ever smoked 100 cigarettes?) - 0=No, 1=Yes; Health coverage (Any family member have health insurance coverage?) - 0=No, 1=Yes; Age – 1=18-34 years, 2=35-49 years, 3=50-64 years, 4=65 years and over; Race – 0=White, 1=Black.

Multivariate Crosstabulations

I examined the relationship between race and BMI, controlling for the factors contributing to obesity. Table 6 reports results on levels of exercise. The majority, 59%, of White women who exercised vigorously and/or moderately were under/normal weight, compared to only a little over a third, 33%, of Black women. In the same category 16% of White women were obese, which is less than half of the percent of obesity among Black women, 35%. The relationship between race and BMI, as measured by gamma, remained at moderate levels when controlling for exercise levels.

Table 6. Moderate/Vigorous Exercise and BMI among White and Black Women

Exercise	BMI	White	Black	Total
Vigorous				
No	Under/Normal	41.7%	30.1%	43.3%
	Overweight	28.7%	32.3%	29.5%
	Obese	24.2%	37.6%	27.2%
Total		**100% (7190)**	**100% (2040)**	**100% (9237)**
γ=.296, p<.001				
Yes	Under/Normal	59.2%	32.5%	55.3%
	Overweight	24.6%	32.4%	25.7%
	Obese	16.3%	35.1%	19.0%
Total		**100% (4224)**	**100% (710)**	**100% (4934)**
γ=.447<.001				
Moderate				
No	Under/Normal	48.3%	31.5%	44.1%
	Overweight	27.5%	31.8%	28.6%
	Obese	24.2%	36.7%	27.3%
Total		**100% (5059)**	**100% (1625)**	**100% (6711)**
γ=.285, p<.001				
Yes	Under/Normal	54.2%	29.5%	50.6%
	Overweight	26.9%	33.2%	27.8%
	Obese	18.9%	37.3%	21.6%
Total		**100% (6355)**	**100% (1098)**	**100% (7453)**
γ=.418<.001				

Of the White respondents who answered "yes" to ever smoked 100 cigarettes, 47% were overweight and/or obese compared to 71% of Black women. Similarly, of the

Whites who never smoked 100 cigarettes, 50% were overweight or obese, compared to 69% of Black women. The relationship between race and BMI, as measured by gamma, remained at moderate levels when controlling for smoking history. Table 7 has additional details.

Table 7. Ever smoked 100 Cigarettes and BMI among White and Black Women

Ever Smoked cigarettes	BMI	White	Black	Total
No	Under/Normal	50.3%	31.5%	46.0%
	Overweight	27.9%	32.6%	29.0%
	Obese	21.8%	35.9%	25.0%
Total		**100% (6237)**	**100% (1827)**	**100% (8064)**
γ=.332, p<.001				
Yes	Under/Normal	53.0%	29.0%	49.4%
	Overweight	26.3%	31.8%	27.1%
	Obese	20.7%	39.3%	23.5%
Total		**100% (5157)**	**100% (907)**	**100% (6064)**
γ=.407, p<.001				

Table 8 reports how often women in the data set received emotional support. For the category of always, forty-six percent of White women were overweight and or obese compared to 68% of Black women. Fifty four percent of White women who rarely or never receive emotional support were overweight and/or obese. The percentage for Black women in the same category is 73%. The relationship between race and BMI, as measured by gamma, remains fairly consistent when controlling for emotional support levels.

Table 8. Emotional Support and BMI among White and Black Women

Emotional Support	BMI	White	Black	Total
Always	Under/Normal	58.3%	31.7%	49.4%
	Overweight	26.9%	33.3%	28.2%
	Obese	19.2%	35.0%	22.4%
Total		**100% (5067)**	**100% (1254)**	**100% (6321)**
γ=.375, p<.001				
Usually	Under/Normal	51.5%	32.5%	48.5%
	Overweight	27.6%	30.9%	28.1%
	Obese	21.0%	36.6%	23.4%
Total		**100% (4185)**	**100% (766)**	**100% (4951)**
γ=.336, p<.001				
Sometimes	Under/Normal	45.4%	26.7%	40.6%
	Overweight	27.5%	32.6%	28.9%
	Obese	27.1%	40.7%	30.5%
Total		**100% (1412)**	**100% (487)**	**100% (1899)**
γ=.310, p<.001				
Rarely or Never	Under/Normal	46.1%	26.7%	41.2%
	Overweight	26.0%	30.5%	27.1%
	Obese	27.9%	42.9%	31.7%
Total		**100% (616)**	**100% (210)**	**100% (826)**
γ=.325, p<.001				

Table 9 reports the analysis of depression. Black women who had high scores on the depression index had a larger percentage of overweight and obesity than White women. The combined percent of overweight and obesity of Black women is 73, while White women had a percent of 54. The relationship between race and BMI, as measured by gamma, remained fairly constant when controlling for levels of depression.

Table 9. Depression and BMI among White and Black Women

Depression	BMI	White	Black	Total
None	Under/Normal	53.7%	32.1%	49.0%
	Overweight	28.4%	32.6%	29.3%
	Obese	18.0%	35.3%	21.7%
Total		**100% (4345)**	**100% (1216)**	**100% (5561)**
γ=.383, p<.001				
Moderate	Under/Normal	51.5%	29.8%	48.0%
	Overweight	26.7%	33.1%	27.7%
	Obese	21.8%	37.1%	24.3%
Total		**100% (4999)**	**100% (973)**	**100% (4951)**
γ=.360, p<.001				
High	Under/Normal	45.8%	27.0%	41.8%
	Overweight	25.9%	30.9%	27.0%
	Obese	28.3%	42.1%	31.2%
Total		**100% (1875)**	**100% (508)**	**100% (2383)**
γ=.310, p<.001				

Forty-three percent of Whites who did not have health coverage or live in a household with someone who was covered were overweight and/or obese, compared to 66% of blacks who answered the same. Among those respondents who did have health coverage or live with someone who did, the relationship between race and BMI was unchanged. The gamma levels were exactly the same. Information is presented in Table 10.

Table 10. Health Insurance Coverage and BMI among White and Black Women

Health Insurance Coverage	BMI	White	Black	Total
No	Under/Normal	56.9%	34.0%	50.9%
	Overweight	23.4%	31.5%	25.6%
	Obese	19.6%	34.5%	23.5%
Total		**100% (657)**	**100% (235)**	**100% (892)**
γ=.373, p<.001				
Yes	Under/Normal	51.2%	30.5%	47.3%
	Overweight	27.4%	32.3%	28.3%
	Obese	21.4%	37.2%	24.3%
Total		**100% (5157)**	**100% (2508)**	**100% (13242)**
γ=.355, p<.001				

Table 11 reports results on education. There is an inverse relationship between education and BMI, the higher the education the lower the BMI. Among Whites with a college degree, 61% were under/normal weight. In the same category, 34% of Blacks were under/normal weight. Forty-three percent of Whites with less than a high school education were under/normal weight compared to 27% of Blacks. The relationship between race and BMI, as measured by gamma, remained at moderate levels when controlling for education.

Table 11. Education and BMI among White and Black Women

Education	BMI	White	Black	Total
Less than HS	Under/Normal	43.3%	26.9%	38.3%
	Overweight	30.7%	32.2%	31.1%
	Obese	26.0%	40.9%	30.6
Total		**100% (1556)**	**100% (689)**	**100% (2245)**
γ=.304, p<.001				
HS graduate or GED	Under/Normal	47.1%	32.3%	44.2%
	Overweight	30.4%	29.7%	30.2%
	Obese	22.5%	38.1%	25.6%
Total		**100% (3467)**	**100% (846)**	**100% (4313)**
γ=.293, p<.001				
Some college or AA	Under/Normal	52.2%	31.3%	48.3%
	Overweight	25.1%	33.9%	26.8%
	Obese	22.6%	35.0%	24.9%
Total		**100% (3523)**	**100% (808)**	**100% (4331)**
γ=.331, p<.001				
College graduate	Under/Normal	60.8%	33.8%	57.5%
	Overweight	23.7%	34.3%	25.0%
	Obese	15.5%	31.9%	17.4%
Total		**100% (2817)**	**100% (382)**	**100% (3199)**
γ=.441, p<.001				

For both races, BMI increases with age. In all categories of age, the percentage of overweight and/or obesity among Blacks is greater. The percentage of women who were under/normal weight is greater among Whites. The relationship between race and BMI,

as measured by gamma, remained at moderate levels when controlling for age. See Table 12 for details.

Table 12. Age and BMI among White and Black Women

Age	BMI	White	Black	Total
18-34 years	Under/Normal	64.3%	41.2%	58.8%
	Overweight	19.4%	27.9%	21.4%
	Obese	16.3%	30.9%	19.8%
Total		**100% (2846)**	**100% (884)**	**100% (3730)**
γ=.389, p<.001				
35-49 years	Under/Normal	52.2%	26.8%	46.9%
	Overweight	24.7%	33.6%	26.6%
	Obese	26.1%	39.6%	26.5%
Total		**100% (3325)**	**100% (872)**	**100% (4197)**
γ=.399, p<.001				
50-64 years	Under/Normal	42.4%	21.8%	38.7%
	Overweight	31.4%	32.0%	31.5%
	Obese	22.6%	46.2%	29.8%
Total		**100% (2459)**	**100% (550)**	**100% (3009)**
γ=.390, p<.001				
65 years and over	Under/Normal	45.9%	28.6%	43.6%
	Overweight	34.3%	39.0%	34.9%
	Obese	19.8%	32.4%	21.5%
Total		**100% (2784)**	**100% (444)**	**100% (3228)**
γ=.309, p<.001				

Overall, normal weight percentages increase as the ratio to poverty threshold increases. See Table 13 for more details. The relationship between race and BMI, as measured by gamma, remained fairly constant when controlling for education.

Table 13. Ratio of Family Income to Poverty Threshold and BMI among White and Black Women

Ratio of Family Income	BMI	White	Black	Total
Under .5 to 1.99	Under/Normal	48.3%	28.4%	42.1%
	Overweight	26.3%	32.3%	28.1%
	Obese	25.4%	39.3%	29.8%
Total		**100% (2571)**	**100% (1167)**	**100% (3738)**
γ=.325, p<.001				
2.00 to 3.99	Under/Normal	48.0%	28.9%	44.9%
	Overweight	28.2%	30.2%	28.5%
	Obese	23.8%	40.9%	26.6%
Total		**100% (2859)**	**100% (560)**	**100% (3419)**
γ=.345, p<.001				
4.0 and over	Under/Normal	55.7%	34.5%	53.6%
	Overweight	26.5%	33.9%	27.2%
	Obese	17.8%	31.7%	19.1%
Total		**100% (3314)**	**100% (357)**	**100% (3671)**
γ=.357, p<.001				

Multivariate Regression

Results of a multiple regression analysis are reported in Table 14, using the six-category BMI dependent variable (1=Underweight, 2=Normal weight, 3=Overweight, 4=Obese class 1, 5=Obese class 2, 6=Obese class 3) and all independent variables. Variables were coded as indicated in the footnote to Table 5. All independent variables were statistically significant predictors of BMI at the .01 level or beyond. However, all relationships were relatively weak. The strongest relationship in the analysis was between race and BMI (standardized coefficient=.161), indicating that the bivariate relationship between race and BMI is affected very little when controlling for the other variables in the equation. The R^2 value revealed that 6.1% of the observed variability in BMI was explained by my chosen independent variables. Other variables explained 93.9% of the variance in BMI between Black and White women from the NHIS 2001 data set.

However, race was the most important of all the independent variables, and the relationship was positive (Blacks coded as 1).

Table 14. Multiple Regression of BMI on Independent Variables (N=10646)

	Unstandardized Regression Coefficient	Standardized Regression Coefficient	t-value	Significance
Independent Variables				
Race	.473	.161	16.371	<.001
Age	.054	.050	4.995	<.001
Vigorous Exercise	-.170	-.071	-7.007	<.001
Smoked 100 cigarettes	-.093	-.040	-4.166	<.001
Emotional support	.059	.045	4.483	<.001
Depression index	.092	.057	5.679	<.001
Health insurance	.139	.029	3.046	.002
Education	-.055	-.048	-4.436	<.001
Ratio of family income to poverty threshold	-.043	-.031	-2.845	.004
	R^2= .061, df=9,10637, p<.001			

Discussion

In general, the findings from this study on BMI and race support the existing research. There is an association between the two variables; African American women are significantly more overweight than White women, even when controlling for numerous disparate variables. The findings also challenged existing research. Among women of both races, the variables vigorous exercise, education, income, depression, emotional support, smoking, health coverage, and age, are not major predictors of body weight. However, the data did yield some informative information. First, as exercise, education, and income increased, BMI decreased. Second, as levels of depression, emotional support, and age increased, BMI increased. Additionally, respondents who had heath care coverage tended to have lower BMIs than those who did not.

Significant race differences did emerge from the data. The discussion is organized around what I expected to find based on the literature and those findings that challenge the literature. Additional details from the data analysis are provided as well.

Supporting the Literature

Physical Activity

I expected a greater percentage of African American women to have a normal BMI if they exercised, because physical activity helps to keep the body's energy balance, opposed to an energy imbalance which results in the body being overweight. Yet, none of the studies in my review of the literature examined physical activity and excess weight among adult women. However, if I were to base my expected findings on the research done among adolescents, I would not expect Black or White women to have an increase in normal BMI rates as a result of exercise. The studies by McMurray et al. (2000) and

Gorden-Larsen et al. (2002) specifically examined excess body weight and physical activity. Both concluded that the risk of being overweight for girls was not significantly altered by physical activity.

The results showed that among African American women who exercised vigorously 68% are still overweight or obese compared to only 41% of White women. The percentages are similar in the examination of women who exercise moderately. Forty-six percent of these White women are overweight or obese compared to 71% of Black women. The lack of physical activity is a contributor to obesity among all races. In this study the majority of Black women who were physically active were still overweight and at a greater prevalence when compared to white women.

Smoking Cessation

The literature on smoking and body weight refers specifically to smoking cessation. Smoking cessation was not measured specifically in the dataset used for this study. Therefore, I did not expect much variance between respondents who had or had not ever smoked. Smokers who quit tend to gain weight because their metabolic rate decreases and food intake generally increases (Ensle 2004). Based on the literature I conclude that smoking may only have a significant role in weight gain or loss immediately after a person quits or begins smoking.

The results for those who had ever smoked did not reveal much difference between Whites and Blacks. In fact the percentages are quite similar for both races. Among Whites who answered "yes" to ever smoked 100 cigarettes, 47% overweight or obese and 50% were overweight or obese for those who answered "no". Of the African American women who answered "yes" 71% were overweight or obese compared to 69%

who answered "no". The difference in BMI levels among the compared groups, for the most part remained unchanged, which was what I expected based on the literature.

Stress (Emotional Support)

The analysis of emotional support and BMI were as expected and supported the literature review on stress and overweight, with the exception of one study. The literature addressed how stress increases the hormone cortisol, which stimulates the appetite, while triggering the secretion of insulin and storing fat (Winnie Yu 2003). My findings support Hargrove and Keller's (1993) research among African American women that found a relationship between stress and weight control behaviors. Respondents would eat unhealthy foods in response to stress. Similar findings were discussed in Walcott-McQuigg's (1995) study of Black women, which showed that women with higher levels of stress were more overweight. However, I thought there may have been a larger difference in the percentage of overweight between those that always received emotional support and those who rarely or never received emotional support, although there is no research to support this.

More than half (68%) of the Black women who always received emotional support were overweight/obese. Of the African American women who never or rarely received emotional support, 73% were overweight/obese. Five percentage points existed between the two categories. The higher prevalence of obesity still existed among Black women in comparison to White women. The gap remained in the percentages of overweight and obesity.

Depression

The literature in this area overwhelming found and supported an association between overweight/obesity and depression among women. To begin, Roberts and colleagues (2003) determined depression is associated with increased risk for obesity and Miller and Harrington's (1997) longitudinal research determined depression is associated with increased risk for obesity. Sex-specific studies in the literature supported my findings as well. Several studies have concluded that there is no association between depression and BMI among men, only women. For example, Carpenter et al. (2003) concluded that obesity was associated with an increased risk of depression among women but not men in their examination of a large national sample of the U.S. population. Faith and colleagues (2001) found a positive relationship between depression and obesity in their study among women but not men also. And a study by Onyike and colleagues (2003) also concluded an association; the prevalence for depression was highest in women with severe obesity.

Depression was found to be related to BMI for both races. Yet, Black women who had high scores on the depression index had a larger percentage of overweight and obesity than White women. The same proved true when no depression was present. The higher prevalence of overweight/obesity existed in every category of depression. As with stress, I expected Black women who were not experiencing depression to have a lower percentage of overweight/obesity. Over half (68%) of the African American women were still overweight compared to 46% of White women. Yet, the numbers did increase to 73% among Black women who were depressed.

Health Insurance

Health coverage was not significantly associated with overweight/obesity. However, I must again note that those who did have coverage tended to have a lower BMI. I was unsure about what my study would conclude in this area, because the literature was not vast, but if I were to base my expected findings on what research was available in this area, the results were expected. Only one study (Hass et al. 2003) that I reviewed specifically observed the association of health insurance and obesity. This studied explored the prevalence of overweight during childhood and adolescence. From this study it was determined that health insurance acts as a preventive measure among adolescents; perhaps those respondents without coverage in this study were once children with no health insurance.

Age

Age is not listed as a specific contributor to obesity. Yet it is common for researchers to include this variable, as did I. The results of this study showed that BMI increased with age, as I expected. The largest increase is between the "18-34" age group and "35-49" age group with 15.1 percentage points for Whites and 14.4 for Blacks. The increases between Blacks and Whites almost mirror each other. I deduce all things being equal metabolism is the primary result of the increase in BMI with age. As individuals age, the metabolic rate decreases. However, many life changes take place between the ages of 18 to 34. This is generally the age group that is starting college, adjusting from school to full time work, getting married, having children, being financially independent or sole financial provider for family and self, etc. It is very likely that with all the life change that personal health no longer becomes and issue and significant increases in

weight may occur. Additionally, individuals over the age of 30 years no longer produce sex hormones that help prevent the depositing of fat in the abdomen (Winnie Yu 2003). It is no coincidence that the largest increase in BMI includes the age group of 30 years.

Socioeconomic Status

The final variable to be discussed among findings that support the literature is SES, as measured by education and income. I expected my results to show an overall decrease in BMI or a greater prevalence of normal body weights as education and income levels increased. My expected results were based on the following studies. Gortmaker and colleagues (1993) found that overweight women had lower incomes and completed fewer years of school. Averett and Korenman's (1999) results reported obese women had a lower attained socioeconomic status than women of recommended weight. Additionally, the Robert and Reither (2004) study found that living in communities with higher socioeconomic disadvantage was associated with higher BMI. While, McMurray and colleagues (2000) research on adolescents reported that both male and female African American and female adolescents in general, no matter the ethnicity, with low SES are more at risk for being overweight.

However, my expectation there might be some variance in the examination of SES and BMI in each category of income and education for White and Black women based on the review of literature was supported. A strong inverse association between SES and obesity among White females especially in the young age group, but not among Black females was found in the Zhang and Wang (2003) study. The adolescent research by Kim et al. (1996) indicated an association between income and education in the prevalence of obesity among White girls, but not Black girls. A lower prevalence of

obesity was seen at higher levels of SES in White girls not Black girls. Gordon-Larson and colleagues (2002) studied adolescents and their parents. The research on adolescents found that overweight prevalence declined with increasing income among Whites and overweight prevalence was lowest for African Americans in mid-income levels, but highest for those with lowest and highest family incomes. For African American female parents there was no statistically significant reduction in overweight prevalence with increasing SES. The next two paragraphs provide a detailed explanation of the results on education and income as to outline the overall results and variances that existed within these variables.

The results on education found that as education levels rose, BMI levels declined. In the examination of each race separately I discovered that increase in education and decrease in BMI is not as clearly outlined among Black women. There is a continuous decline in BMI for White women as education increases but the same did not prove true for African American women. There is a noticeable decrease in overweight/obesity among Black women in this study with an educational level of "Less than HS" (73%) and "HS graduate or GED" (68%). From the level of "HS graduate or GED" to "Some college or AA" there is no decrease. In fact there is a slight increase to 69%. The final educational level of "College graduate" a decrease in overweight/obesity occurs again. The percentage drops to 66. In all education levels from high school graduate and above the levels of BMI remain for the most part unchanged.

In my analysis of income, measured by using ratio to poverty threshold, the results showed that overall, as income increased BMI decreased. I discovered that no decrease in overweight would occur for either race of women until an income of four

times above the poverty threshold was attained. And once this level is reached Black women did not decrease their percentage of overweight at the rate of White women. The higher prevalence still existed. However, the decrease in overweight/obesity was not present between the lowest (less than .5 to 1.99) and middle (2.00 to 3.99) ratios. Unlike education, the decrease of BMI with income is very similar among Black and White women. The consistent decrease holds true for both groups once respondents reached the ratio of "4.00 and above". Fifty-two percent of white women with a ratio of "2.00 to 3.99" are overweight/obese but the percentage decreases to 44 at the "4.0 and over" ratio. The decrease was not as high for African American women in the study. Seventy-one percent are overweight/obese at a ratio of "2.00 to 3.99". This percent decreased to 66% for Black women with a ratio of "4.00 and over".

Challenging the Literature

Stress (Emotional Support)

My findings do not support the study by Brunner (1997) on stress and increased BMI among women. This may have been due to the fact that only seven percent of the study participants were African American or that the measurement of stress was different. Brunner's study used the Perceived Stress Scale (Cohen 1983) and I measured emotional support. The perceived stress scale is a widely accepted valid measure of stress. I examined emotional support with the belief that if present it may help to reduce the amount of daily stress experienced.

Depression

My findings support those studies that have found an association between depression and obesity and it appears to be a slightly stronger connection among Black

women. However, some research yielded a nonexistent relationship. According to the literature some researchers have found that there is no association between depression and overweight. Hallstrom and Noppa (1981) studied a series of mental illnesses in which depression was included, and found no association between obesity and present or past illness. Another study (Palinkas et al. 1997) also using the same mental health measure concluded the same in a population of women ages 50 to 89 years. The different results could be related to the different variable measurements. Depression was not examined specifically but rather as part of several different types of mental illnesses in the two previously mentioned studies in this paragraph. Additionally, the age ranges in the populations were different. It is not unusual for the effects of one variable to decrease when grouped with many others.

Study Conclusions

All of my independent variables were statistically significant predictors of BMI. Most notably the strongest relationship was between race and BMI. Therefore I can conclude that even when controlling for vigorous exercise, education, income, depression, emotional support, smoking, health insurance coverage, and age, race is the most important predictor of BMI. Strong Race effects still remained when controlling for the independent variables listed above.

Limitations of the Study

A noted limitation to secondary quantitative data analysis is that one can only examine the available variables in the data set, all of which may not truly represent what was identified in the literature. There were five predictors or contributors associated with obesity in which I was unable to examine in this study. To begin, a family medical

history of those respondents could not be obtained. The use of current medications and existing health problems that have been identified to cause or increase body weight was unknown. Genetics can influence the amount of fat stored and where it is deposited; as well as, create a predisposition to excess weight. Secondly, I was unable to determine if respondents suffered from any type of eating disorder, which is associated with unhealthy weight gain. Next, the environment in which the women lived is also unknown. Did they live in a rural or urban community? Was the environment conducive to healthy living? The answers to these questions are not known. Which leads me to my forth contributor, diet. I was unable to identify the daily diet of respondents. An energy imbalance may occur as part of an unhealthy diet. Finally, I was unable to measure distress experienced as a result of sexism and racism by the African Americans in the data set.

There were also five measurement limitations to the variables used in the study. To begin, the variable used to measure physical activity had measurement issues. Respondents self reported if they participated in vigorous activities during that day, week, month, year, or never. All responses except for "never" were placed in the "yes" category. My measure does not truly determine if participants were physically active on a daily or weekly basis. Additionally, researchers did not directly monitor vigorous activities of respondents; it is possible the self-reports were not accurate or respondents had different definitions of "vigorous". Second, smoking cessation was not truly examined. The question "*Have you ever smoked at least 100 cigarettes in your entire life*" did not measure cessation. It did not identify if respondents recently began smoking or recently quit smoking. Next, the variable stress was not measured. I examined

emotional support, as it helps to reduce and relieve stress. Stress is the effect or result of something else. Some factor must be present to cause stress. Emotional support is not the same. It acts as a foundation or outlet for daily life experiences, good or bad. Emotional support may be present without the effects of outside factors. The stress experienced in daily life by women in this analysis was not measured. Fourth, the validity of my depression index can be debated. Was it a good measure of depression? Respondents were not clinically diagnosed as depressed. I chose four questions, and I created an index, which I believed was an adequate measure for depression. If respondents consistently answered "ALL of the time" or "MOST of the time" to the four questions[7] used to create my index, it is my belief that they were likely depressed. Finally, health care coverage was not adequately measured. Whether or not the respondents themselves in the data set had health insurance was unknown. The variable I used only determined if they or anyone in their household had some kind of health care plan. I needed to determine if the women analyzed in my study had health coverage and the measurement used was unable to determine that. In addition, among the women who answered "yes" I was unable to determine the type and adequacy of coverage, and if they had a primary physician who they visited regularly.

Theoretical Implications

The conceptual framework for this study focuses on race as a social construction and the intersectionality of race, class, and gender, as well as the unique position of Black women in the U.S. The variables analyzed in this data set did not explain much variance in body weight between Black and white women.

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[7] The depression index is discussed on page 49.

The theoretical framework for the study may assist in finding an answer(s). The biological differences between Whites and Blacks have not been able to explain the racial health gap. Further analysis of the unique position of African American women may yield some answers. The health needs of Black women should be addressed by looking at the point where racist health policies or sexist health policies converge and form a barrier to their mental, emotional and physical health (Barbee and Little 1997). A closer examination of social class will support these efforts. Often when researchers examine class, they study socioeconomic status. This means that education and income are only observed. Social class digs deeper. It examines economic, political, cultural, and social resources. Additionally, this framework suggests probing in the daily experiences of African American women. A lack of access to authority and resources exists for all women, and this is especially true for minority women. What contributing factors are being missed because they are not blatantly apparent?

Barbee and Little (1997) also encourage exploration in the health care arena. African American women currently and historically have been victimized. Examination of the past may aid in finding answers in the present. Investigation into the measurement of BMI is in line with an exploration of the health care area. Are the numbers for normal body weight accurate for all people or only a reflection of European standards, which influence American society and norms? Should women be held to the same standards of healthy body weight as men? Taking a closer look in the arena of health care may answer these questions and set standards for future research on this subject matter.

Finding any answers as to why African American women have a higher prevalence of overweight and obesity in comparison to White women should begin with

examination of their unique position in U.S. in the context of the intersection of race, class, and gender.

Recommendations for Future Research

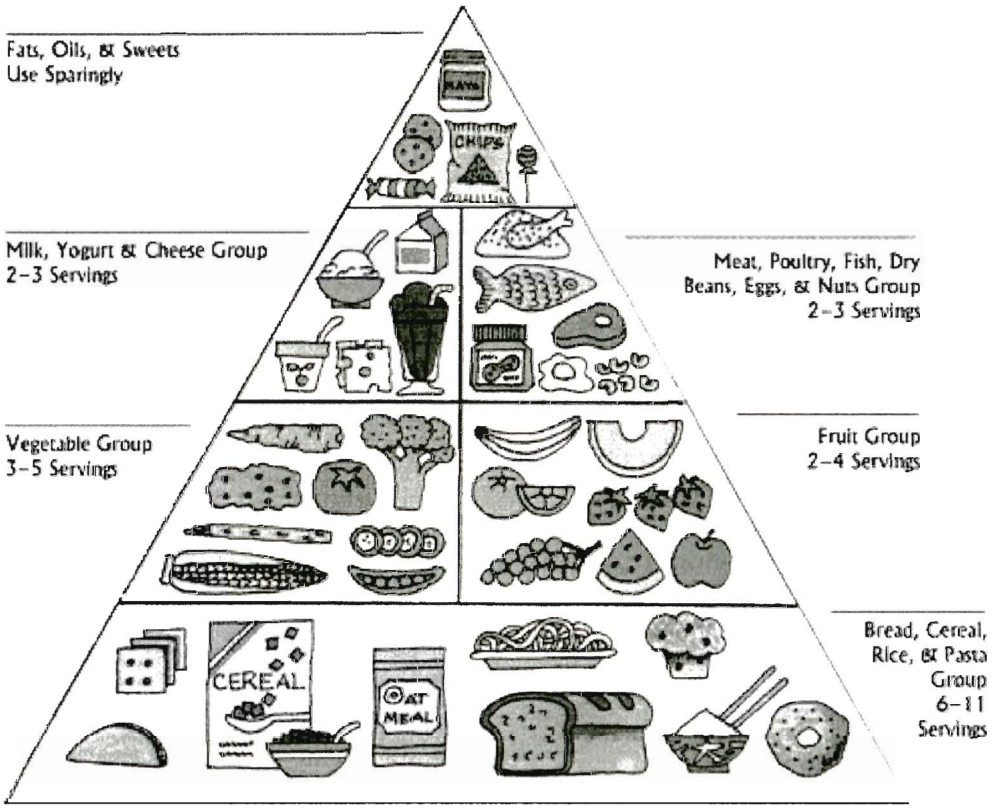
Additional research is needed to further explain the higher prevalence of overweight and obesity among African American and White women in the U.S. This study concluded that only 6% of the variance among these two groups was explained by my chosen variables. Thus far, no research has conclusively found what factor(s) causes the difference among body weight when comparing racial groups.

I would encourage a longitudinal and/or qualitative study, representative of all Black women in the United States. Not only will Black women's current situations be analyzed, but also their families and family history by generation. By generation, I am referring to noting the weight and lifestyle of their mothers, maternal grandmothers, and female children if applicable. This would assist in a closer look into the culture of African American women as well. Researchers could determine how much influence a general acceptance of the full figured woman has on the higher prevalence of unhealthy weight in this population and if it differs by generation. A qualitative study would also allow researchers to examine the great majority, if not all, of the factors listed in the literature and the suggested areas of examination supported by my theoretical framework. A longitudinal study can examine trends and possibly identify life changes and causal factors. Ideally the study would begin with adolescents, since the literature reveals that factors in adolescence can affect adult body weight. The limitations discussed in this study would not be an issue. Family medical history, current medications or illnesses, genetics, diet, and distress can all be examined.

It is would be very challenging for a quantitative analysis to examine the theoretical framework of this study. It calls for a microscopic analysis of the daily lifestyle of each individual and their families in the study. This involves detailed conversations with people and an assessment of institutions that exist in the U.S.

Research comparing African Americans to other races has been conducted in abundance. An examination of this subgroup of the population as outlined may yield some possible reasons and/or explanations for the existing Racial Health Gap in the U.S, particularly the higher prevalence of overweight and obesity among African American women.

Appendix I


Fats, Oils, & Sweets
Use Sparingly
Milk, Yogurt & Cheese Group
2–3 Servings
Meat, Poultry, Fish, Dry
Beans, Eggs, & Nuts Group
2–3 Servings
Vegetable Group
3–5 Servings
Fruit Group
2–4 Servings
Bread, Cereal,
Rice, & Pasta
Group
6–11
Servings
CHIPS
CEREAL
OAT MEAL

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